



Sudden formation of bi-directional ion beam and associated large-scale configuration change in the equatorial ring current at 19 MLT and L=4.

M. Yamauchi (1), **R. Lundin** (1), H. Nilsson (1), I. Dandouras (2), H. Reme (2), G. Stenberg (3), M. Andre (3), P.-A. Lindqvist (4), P.W. Daly (5), H. Frey (6), Y. Ebihara (7), E. Kronberg (7), and A. Balogh (8)

(1) IRF, Kiruna, Sweden, (2) CESR, Toulouse, France, (3) IRF, Uppsala, Sweden, (4) Alfvén Lab., KTH, Stockholm, Sweden, (5) MPS, Katlenburg-Lindau, Germany, (6) UCB/SSL, Berkeley, CA, USA, (7) IAR, Nagoya U., Nagoya, Japan, (8) Blackett Lab., ICL, London, UK

An unusual bi-directional beam event took place inside the dayside ring current in the evening sector (19 MLT) near the Cluster perigee. Both the flux and energy extent of ions are outstandingly high among all isolated local energization events inside the ring current during 5 years Cluster perigee data. The bi-directional beams in both parallel directions are suddenly observed at around 0648:30 UT nearly simultaneously (in 12 sec resolution) at all spacecraft which are separated within about 1 min (SC-1 and SC-3) in the north-south (Z) direction. The beams have the same velocity for all H⁺, He⁺, and O⁺ in both directions and are accompanied by large change (about 5 mV/s) of DC electric field. The broadband electromagnetic wave, which are most likely caused by the bidirectional beam started simultaneous at all spacecraft within 1 second. The event took place about 6 minutes after the arrival of strong DC electric field associated with westward traveling substorm bulge during minor geomagnetic activity, the condition of which is not outstanding to explain the uniqueness of the event. The event is also accompanied by sudden flux decrease of ordinary ring current (> 10 keV), indicating the large-scale configuration changed simultaneously with these bidirectional beams.